J. KAUFMANN.

HARNESS FOR CROSS WEAVING.

APPLICATION FILED MAR. 23, 1912.

1,037,151. Patented Aug. 27, 1912.

Fig. 2.

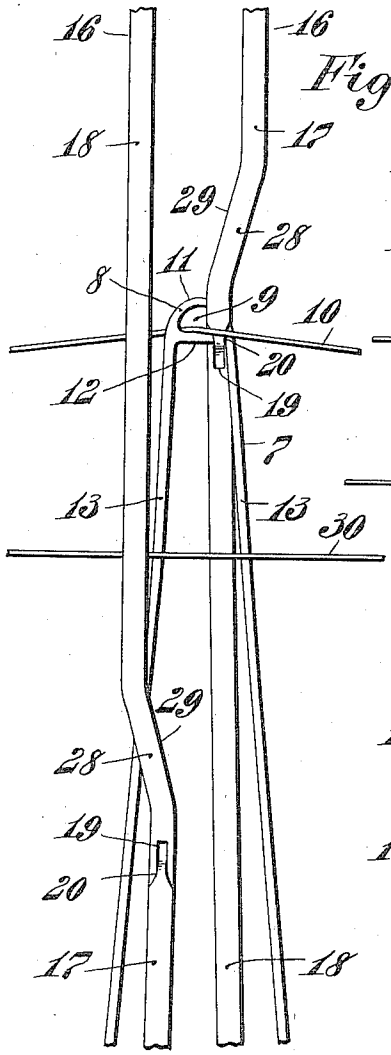


Fig. 1.

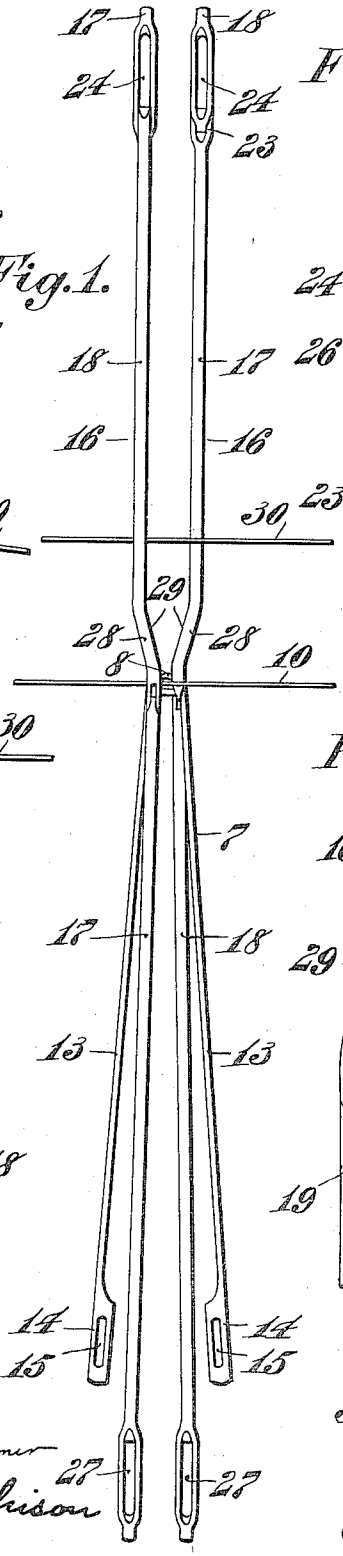


Fig. 3.

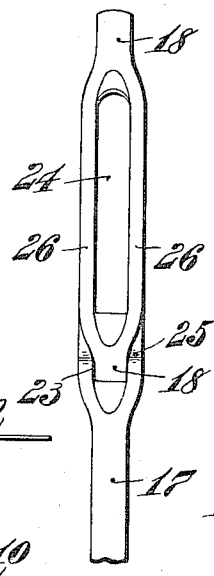


Fig. 4.

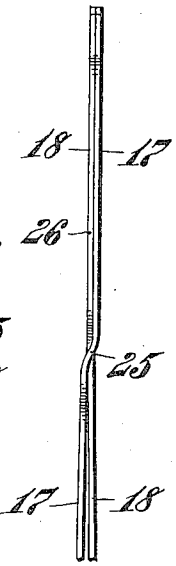


Fig. 5.

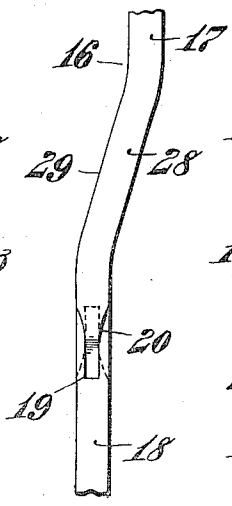
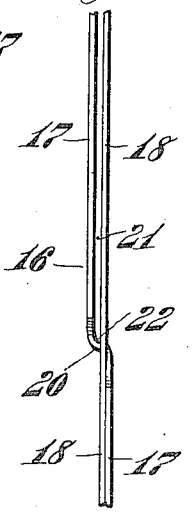


Fig. 6.



Witnesses:

Elizabeth J. Blanner

William S. Atchison

Inventor:

Jacob Kaufmann,

By Jas. C. Wolvesmith

Attorney.

UNITED STATES PATENT OFFICE.

JACOB KAUFMANN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO STEEL HEDDLE MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

HARNESS FOR CROSS-WEAVING.

1,037,151. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed March 23, 1912. Serial No. 685,660.

To all whom it may concern:

Be it known that I, JACOB KAUFMANN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Harness for Cross-Weaving, of which the following is a specification.

My invention relates to loom harness for use in that method of weaving known as "cross weaving", sometimes called "doup weaving" or "gauze weaving", and in which the warp threads arranged in pairs are crossed and twisted about each other at as many points in the shed as may be desirable, either for a succession of picks or for single picks arranged according to a pattern or design to be produced.

The principal object of my invention is to provide a metal harness for cross weaving which will be simple, durable and efficient for all classes of cross weaving, but which is particularly useful in weaving the finer kinds of such fabrics to produce which it has heretofore been necessary to employ the short lived cotton harness.

A further object of my invention is to produce a harness for cross weaving in which all possibility of fouling of the warp threads will be eliminated.

My present invention relates more particularly to the construction and formation of the guide or lifting heddles which are employed to selectively raise a doup needle controlling the doup warp on the one side or the other of the standard warp.

My invention more particularly contemplates guide or lifting heddles made from thin flat metal or wire and a doup needle made of thin flat metal, to the end that a large number of sets of heddles may be arranged in the harness so that the invention is applicable to weaving the finer classes of goods.

The nature and characteristic features of my invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof, in which—

Figure 1 is a vertical elevation of one set of heddles for controlling a pair of warp ends; Fig. 2 is an enlarged detail view of the central portion of the same, the heddles being shown in shifted relationship; Figs. 3 and 4 are respectively face and edge views enlarged of the upper mortised end of the guide or lifting heddle; and Figs. 5 and 6 are respectively face and edge views enlarged of the central portion of said guide or lifting heddle.

Referring to the drawings, in the particular embodiment of my invention there shown, 7 is the doup heddle or needle which is preferably made by punching or stamping from a thin flat strip of metal, and has at one end an eye portion 8 lying in a single plane and in which the eye 9 for the control of the doup warp 10 is located. The outer margin 11 of the eye end 8 of the doup heddle 7 is arched or curved while the inner under margin 12 of the eye end 8 is preferably flat. Depending downwardly from the eye end 8 of the doup heddle 7 are two legs 13 which terminate at their lower extremities in enlarged portions 14, each of which is provided with a slot 15 for connection of the doup heddle with the means of control which may be of any of the forms which are common and well known in the art.

There are provided two guide or lifting heddles 16 each of which is made of two thin flat strips of metal or wire 17 and 18 arranged side by side and suitably interlaced at their central portion and preferably also interlaced at their upper mortised ends. The manner of interlacing the two strips 17 and 18 at their central portion is preferably accomplished by slitting the strip 18 as at 19 and complementally reducing the width of the strip 17 as at 20 and bending said strip 17 at the reduced portion 20 to cause the portions of the strip above and below said reduced portion to lie in separate planes, as clearly shown in Fig. 6 of the drawings. In assembling the completed guide heddle 16 the strip 17 is first passed through the slot 19 of the strip 18, and the reduced portion 20 of strip 17 brought into engagement with said slot and the strips then turned to occupy the position shown in Figs. 5 and 6. The portions of the strip 17 above and below the reduced portion 20 are arranged in planes sufficiently separated to provide in the assembled structure a space or opening 21 for the re-

ception of the upper end of the doup needle 7, the under margin 12 of said doup needle 7 in operation resting on the upper surface 22 of the bent or offset portion of the strip 17.

For convenience in handling and also to prevent disarrangement of the assembled strips 17 and 18, I preferably unite the top portions of said strips to each other by also interlacing the same. The strips 17 and 18 are provided with the usual mortises 23 and 24 at their top ends for mounting the same on the heddle frame rods or for connection to the jacquard or other pattern forming mechanism as the case may be. These mortises 23 and 24 are preferably formed as described and shown in Letters Patent No. 950,169, dated February 22, 1910, granted to William Fehr and myself, and in order to permit the upper ends of the strips to be interlaced, the mortise 23 of strip 17 is preferably made longer and offset as at 25 at the lower end of the mortise at which point the strip 18 passes through the mortise 23 and the enlarged or more widely separated shanks 26 of the mortise 24 will serve to maintain the strip 18 in its interlaced position. The guide or lifting heddles 16 are also provided with mortises 27 at their lower ends for mounting in the harness, but it is not essential to interlace the same as at the top, although this may be done if desired. The guide or lifting heddles 16 are also bent or offset out of a straight longitudinal extension as at 28 to provide inclined edges 29 on the inner sides of said guide or lifting heddles and also to maintain the two heddles 16 of each set a suitable distance apart above the lowermost or neutral position of the eye of the doup needle, this arrangement serving to permit a more free action of the warp ends and prevent fouling of the same.

The operation of the device will be readily apparent to those skilled in the art, as it will be seen that as one or the other of the guide or lifting heddles 16 is raised the doup thread 10 which passes through the eye 9 of the doup needle 7 will be carried above the standard thread 30 and to the one side or the other of said standard thread according to which guide heddle is raised. On account of the offsetting of the guide heddles at 28 there will be provided a sufficient space for the free and easy passing of the warp ends as the doup needle is actuated and the location of the offset 28 is such that the inner inclined edge 29 forms a guide to direct the standard thread 30 over the end of the doup needle without possibility of fouling. Furthermore there are no rough places on the faces of the heddles which would interfere with the free and easy action of the parts or the warp. It will also be seen that the maximum thickness of each set of heddles is but equivalent to the thickness of the two strips forming the guide heddle and the doup needle which is mounted therebetween, so that a larger number of sets may be mounted in the harness for weaving the finer classes of goods.

Having thus described the nature and characteristic features of my invention what I claim as new and desire to secure by Letters Patent is:—

1. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal interlaced intermediate their ends to form a support for engaging the doup needle.

2. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal interlaced intermediate their ends to form a support for engaging the doup needle, and interlaced at their ends.

3. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal, one of said strips having a slot intermediate the ends, and the other of said strips passing through said slot to thereby form a support for engaging the doup needle.

4. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal, one of said strips having a slot intermediate the ends, and the other of said strips having a complemental reduced portion passing through said slot to thereby form a support for engaging the doup needle.

5. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal, one of said strips having a slot intermediate the ends, and the other of said strips being offset to lie in two planes and passing through the slot in the other strip at the offset portion to thereby form a support for engaging the doup needle.

6. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal interlaced intermediate the ends to form a support for engaging the doup needle, and being offset out of their straight longitudinal extension.

7. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal, and a doup needle mounted between said strips, the strips being interlaced intermediate their ends to form a support for engaging said doup needle.

8. In harness for cross weaving, a guide or lifting heddle comprising two thin flat strips of metal, and a doup needle mounted between said strips, said doup needle comprising a thin flat piece of metal having an eye portion and two legs extending therefrom, and the strips being interlaced intermediate their ends to form a support for the eye portion of said doup needle.

9. In harness for cross weaving, a pair

of guide or lifting heddles each comprising two thin flat strips of metal, a doup needle mounted between said strips, said doup needle having an eye portion at one end having a rounded outer margin, and the strips being interlaced intermediate their ends to form a support for the eye portion of said doup needle.

10. In harness for cross weaving, a pair of guide or lifting heddles each comprising two thin flat strips of metal, a doup needle mounted between said strips, said doup needle having an eye portion at one end having a rounded outer margin, and the strips being interlaced intermedate their ends to form a support for the eye portion of said doup needle and being offset adjacent said support out of their straight longitudinal extension.

In testimony whereof, I have hereunto signed my name in the presence of two witnesses.

JACOB KAUFMANN.

Witnesses:

LILLIAN H. NERTEL,

WILLIAM S. ATCHISON.